the vertical array and also an output on one of lines **25–28** in the horizontal array of the touch tone buttons. The particular pair of lines which are energized will depend upon the particular button in the touch tone keyboard which is depressed. The signals appearing upon the pair of lines representative of the button depressed will be decoded in the decoding matrix such that a high or potential will be applied to both gates of a particular nand gate representative of the number depressed. That particular nand gate, upon the appearance of two highs, will swing to a low output. The remainder of the nand gates will remain with high outputs.

A plurality of resistors **R1-R7** are connected across each of the respective lines **22–28** to ground to maintain the inputs to the nand gates at ground potential until a button is depressed. In this manner, it is assured that the output of the nand gates will be maintained low until a button in the keyboard is depressed.

Each of nand gates **G1–G12** has associated therewith a relay **RL-1** through **RL-12** respectively. These relays are driven by a 6 volt source. Whenever the particular nand gate associated with a particular button goes low on its output, the 6 volt source is effected through the relay to energize the relay and pull in the associated contact **C1–C12** associated with the respective relays.

Each of the respective contacts **C1–C12** are wired into the electronic calculator disposed within the housing as the keyboard input to the calculator. Each of the respective function buttons which are positioned in the housing of the telephone are, likewise, wired into the electronic calculator in a conventional manner. These are then shown in FIG. **3** set apart for completeness of the disclosure.

From the foregoing it will be appreciated that the telephone may be utilized in an ordinary manner for dialing. Whenever it is desired that the telephone be utilized as a calculator, switch **14** is depressed and contacts **S1-A** through **S1-H** switched to their position shown in FIG. **2** whereupon the keyboard of the telephone will be directly connected as an input to the calculator housed within the telephone. The arrangement of switches shown in FIGS. **2** and **3** is such that the calculator will function while the telephone is not in use as well as while the telephone is being used for conversation. Inasmuch as switch **S1** disengages the telephone keyboard from the tone generators, utilization of the calculator while carrying on a conversation over the phone will not disrupt the telephone conversation.

The voltages needed to operate the electronic calculator and associated switching circuitry may be created by use of a plug in transformer similar to the type used for lighting the dial of a princess telephone. The AC voltage is then rectified, filtered and regulated to 6 volts DC by use of a zener diode in a conventional and well known manner.

Thus it will be appreciated that the improvements to conventional telephones of the present invention provide maximum utilization of components of the telephone to provide a space saving device and dual function and use of the components of a conventional telephone.

The foregoing description of the present invention has been made in respect to particular embodiments shown thereof in the drawings. Other embodiments and modifications thereof will now become apparent to those skilled in the art. It is to be understood that no limitation as to the scope of the invention was intended by the description thereof in respect to particular embodiments shown in the drawings but is to be interpreted in view of the appended claims.

I claim:

1. In a communications device such as a telephone including a housing, input-output lines, a numeric keyboard providing seven separate outputs as inputs to a dual tone generator to create 12 separate tone pairs, the improvement permitting dual use of the telephone keyboard for tone dialing and as an input to a calculator comprising:

an electronic calculator positioned within the telephone housing and including numeric inputs from zero to nine plus function inputs;

switch means disengaging the seven outputs of the keyboard from the tone generators and providing the seven separate outputs as inputs to a decoding matrix; and

a decoding matrix for decoding the seven outputs into twelve outputs representative of the numeric keyboard designations and applying the decoded outputs as inputs to the calculator.

2. Communications device of claim **1** wherein the decoding matrix includes 12 separate dual input nand gates.

* * * * *